A NEW SUBSPECIES OF *GRAPHIUM KOSII* MÜLLER & TENNENT (LEPIDOPTERA: PAPILIONIDAE) FROM NEW BRITAIN, PAPUA NEW GUINEA

CHRIS J. MÜLLER[1], LAURIE WILLS[2] and EDWARD PETRIE[3]

[1]*Molecular Ecology Laboratory, School of Biological Sciences, Macquarie University, Sydney, NSW 2109 (address for correspondence: PO Box 3228, Dural, NSW 2158)*

[2]*PO Box 24305, Manners Street, Wellington, New Zealand*

[3]*Unit 14/46 Cremorne Street, Neutral Bay, NSW 2100*

Abstract

Graphium kosii gigantor subsp. n. is described and illustrated from New Britain, Papua New Guinea. Its external facies and behaviour are compared with the nominate subspecies from New Ireland.

Introduction

The *weiskei* group of *Graphium* Scopoli comprises six closely related, allopatric species: *G. macleayanum* (Leach), *G. weiskei* (Ribbe), *G. batjanensis* Okano, *G. stresemanni* (Rothschild), *G. kosii* Müller & Tennent and *G. gelon* (Boisduval). All are restricted to the Australian Region, from Maluku in eastern Indonesia, throughout New Guinea, including the Bismarcks, to eastern Australia and New Caledonia. With the exception of *G. macleayanum* and *G. gelon*, all species are confined to montane regions. Müller and Tennent (1999) presented a key to all species.

Graphium kosii (Figs 1-2) was known previously only from the type series collected by one of us (CM) at high altitude in the Hans Meyer Range, southern New Ireland. In describing the species, Müller and Tennent (1999) suggested that *G. kosii* would likely be discovered on New Britain. Here we describe a large, distinctive new subspecies from specimens collected in the Whiteman Range, West New Britain during December 2005, and the Gazelle Peninsula, East New Britain during November 2007.

Graphium kosii gigantor subsp. n.

(Figs 3-4)

Types. Holotype ♂, PAPUA NEW GUINEA: Whiteman Range, West New Britain, 1050 m, 10-18.xii.2005, C.J. Müller, in Australian National Insect Collection, Canberra. *Paratypes*: 1 ♂, same data as holotype, in C.J. Müller collection, Sydney; 5 ♂♂, 1 ♀, Gazelle Peninsula, East New Britain, 1000 m, 12-19.xi.2007, L.R. Wills, in L.R. Wills collection, Wellington.

Description. Male (Figs 3-4). Forewing length 45 mm; antenna 20 mm. Head light grey, clothed with dense grey hairs; labial palpus grey; antenna brown with club dorsally black. Thorax densely haired, light to medium grey, beneath with slight pink tinge; legs green. Abdomen with thick hairs, grey-brown above and yellow-brown beneath. Forewing upperside with ground colour black; a series of small, white submarginal spots from near costa to vein CuA_2; a large, rounded, deep green subapical patch; a large, 'hour-glass'

shaped marking in distal portion of cell, bright green in costal 1/3 and bright turquoise in remainder; two smaller turquoise spots im median area at end of cell to vein CuA_1; a large, basal turquoise area below cell and vein CuA_1, not extending beyond median area. Forewing underside with ground colour brown in postmedian and apical area, dark brown/black in remainder; a series of white submarginal spots as on dorsal surface, including additional spot below vein CuA_2; blue-white replacing turquoise markings of upper surface and green as above, except for additional large green cell patch occupying 3/4 of the cell. Hind wing relatively broad, with spatulate tail at vein CuA_1; inner margin with fold supporting numerous dense grey hairs; lobed conspicuously at tornus. Hindwing upperside with ground colour black; deep blue-green basal area occupying 2/3 of cell; basal area white between veins Rs and costa; a small irregular white spot in apical area with a vestigial blue spot behind it; two well spaced, turquoise tornal spots between veins M_3 and CuA_2; tornal lobe dark brown/black. Hindwing underside with ground colour deep brown, darkening towards median area; a deep green basal area extending from bottom of cell and beyond; veins 1A+2A and CuA_2 slightly bowed proximally to costa; narrowly crimson along costa at base and near apex; a white line separating basal area from brown distal 2/3 of hind wing; an acute, narrow white bar in median area between veins CuA_2 and M_3; brownish-white scales between inner margin and cell, absent below junction of cell and vein 1A+2A; brownish-white scales in submarginal area; vestigial bluish scales in tornal area identical in shape to tornal markings on upperside.

Female. Forewing length 48 mm; antenna 21 mm. Wings paler and more rounded than those of male. One female observed in the field at the type locality (see Discussion) was significantly larger than those of *G. k. kosii*. The paratype female is not illustrated due to its very poor condition.

Discussion

Graphiom kosii gigantor is a large, striking taxon, readily separable from the nominate subspecies. Apart from its larger size, it has longer hindwing tails than *G. k. kosii* and the forewings are more elongate. The pale blue median area on the upperside of the forewing is also more restricted in *G. k. gigantor* than in *G. k. kosii*. The genitalia of the two taxa were not compared in this study.

In the field, *G. k. gigantor* showed different habits from those of *G. k. kosii*. Males of the former established territories at the tops of mountains, which they vigorously defended while flying in tight circles well above the canopy. In West New Britain, males were collected by standing in the uppermost branches of the tallest trees and using very long net handles. Males of *G. k. kosii* were readily lured to within reach with bright objects, yet those of *G. k. gigantor* showed no attraction, even if the lures were attached to long poles and elevated above the canopy.

Figs 1-4. *Graphium kosii*, males. Odd numbers upperside, even numbers underside. (1-2), *G. k. kosii* (Hans Meyer Range, New Ireland); (3-4), *G. k. gigantor* (East New Britain). Figures natural size.

In West New Britain, a female *G. k. gigantor* was observed to oviposit on the fresh growth of a monimiaceous tree about 15 metres above the ground. The foliage was searched but no eggs were located. The tree was possibly a species of *Dryododaphne* (Monimiaceae), which has been recorded as a potential food plant for *G. weiskei* in mainland Papua New Guinea (Braby and Armstrong 2001).

Acknowledgements

David Lindley, John Kirakar and Peter McNeil of New Guinea Gold (formerly Macmin) were exceptionally generous in providing access to the type locality of *G. k. gigantor* by helicopter.

References

BRABY, M.F. and ARMSTRONG, J. 2001. A note on the larval food plants of *Graphium weiskei* (Ribbe) (Lepidoptera: Papilionidae) in Papua New Guinea. *Australian Entomologist* **28**(3): 65-68.

MÜLLER, C.J. and TENNENT, W.J. 1999. A new species of *Graphium* Scopoli (Lepidoptera: Papilionidae) from the Bismarck Archipelago, Papua New Guinea. *Records of the Australian Museum* **51**: 161-168.